



F-35 Lightning II Program

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MARINE OSPREYS SUPPORT LIGHTNING AT SEA

By Cpl. Anne Henry

ATLANTIC OCEAN - As Marines and sailors have been working together to conduct an assessment of F-35B Lightning II integration into amphibious operations over the past two weeks, they are learning to overcome the challenges inherent in maintaining and resupplying one of the world's most advanced pieces of military technology while out at sea.

One key component of the F-35B Operational Trials, or OT-1, included assessing the maintenance and logistical measures necessary to keep the F-35B flying aboard a U.S. Navy amphibious vessel in standard sea conditions.

The F-35B engine power module found itself at center stage of the OT-1 supply and logistics capability assessment about sixty miles off the East Coast of the United States May 21.

The power module is the largest and most important part of the F-35B's engine. Weighing about 4,500 pounds, safely transporting this intricate piece of technology from a storage facility on a military base in the States, across ocean waters, and onto the deck of a pitching ship is no easy task. And it had never been done before.

"The power module is the core of the F-35B engine," said Michael Chotkowski, who is in charge of F-35B deployment integration with Pratt & Whitney. "The engine is broken down into five different modules: fan, augments, nozzle, gearbox and the power, which is the number one module."

Up until a few months ago, there was no way to transport replacement power modules to a ship, or damaged power modules from the ship to a repair facility. That was, until a system was put in place using an MV-22B Osprey, a shipping stand constructed with internal suspension, known as a "buck," and an overhead bridge crane aboard the ship to insert the power module into the plane.

"Pratt & Whitney had to design and build a shipping buck that could constrain and protect the power module when it is in the back of an MV-22B," said Jeff Ward, who is in charge of F-35B deployment integration with Headquarters Marine Corps. "The buck, which is the critical piece here, did not exist six months ago. It was created to hold and protect the power module while it is being transported."

The buck was designed as a portable casing to roll the power module onto and off the Osprey. It also serves to protect the power module in the back of an MV-22B Osprey as it flies across the open sea, where it is subjected to the standard movement and vibrations that are inherent in amphibious flight operations due to high winds and rough water.

"The buck has four solid steel posts and two tools on the front and on the back mount of the engine cases. This provides structural integrity," said Chotkowski. "It also has vibratory isolators built into it that are tuned to dampen out the frequencies that come from the MV-22B, and could do damage to the bearings in the power module."

Part one of the operation consisted of loading the power module onto a buck at Naval Air Station Patuxent River, Maryland. Next, an MV-22B Osprey from New River, North Carolina flew into PAX River to pick up the module and buck. Then the Osprey flew more than 60 miles out to the ship, touching down on the deck of USS Wasp, as it rolled with the waves. The team then wheeled the buck out of the Osprey and onto the deck of the ship, with just several inches of clearance on either side.

"The process of unloading the module from the MV-22B is very difficult, because even though the module outside of its container is smaller, it is still very large for the MV-22B," said David Myers who is a part of the cargo and special operations team with U.S. Naval Air Systems Command. "It took 16 straps to tie it down in the aircraft. Cargo in the MV-22B needs to be restrained in a specific manner, and it takes a lot of straps to hold down 9,000 pounds."



A power module for the F-35B Lightning II is moved out of an MV-22B Osprey and onto the USS Wasp (LHD-1), at sea May 22 during an evolution part of Operational Testing 1. OT-1 is serving the purpose of evaluating the full spectrum of F-35B measures of suitability and effectiveness, as well as assessing the integration of the aircraft into the spectrum of flight operations. (Marine Corps photo by Cpl. Anne K. Henry/RELEASED)

The next stage dealt with lowering the power module down to the ship's maintenance bay, and proving the ability to safely transfer the module from the shipping buck into an existing container. This was accomplished by personnel from Marine Operational Test and Evaluation Squadron 22. "We had to show that we could use the Navy's overhead bridge crane [built into the ceiling of the hangar bay] to transfer the power module from the shipping buck to an existing container, where it can be stored for long term if necessary," said Chotkowski.

The demonstration proved to be successful, allowing for data to be drawn and lessons to be learned for future F-35B deployments aboard amphibious vessels.

"From this evolution, we know that we can now put a power module into an MV-22B and bring it out to an amphibious vessel," said Ward. "We can now resupply the Marine Corps, Navy and Air Force in any environment by using the MV-22B. This is an important milestone for the program."